


Woods Hardwick		Page 1
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm



Pipe Sizes STANDARD Manhole Sizes MANHOLESFA5

FEH Rainfall Model	
Return Period (years)	2
Site Location GB 450500 225250 SP 50500 25250	
C (1km)	-0.023
D1 (1km)	0.328
D2 (1km)	0.309
D3 (1km)	0.264
E (1km)	0.292
F (1km)	2.461
Maximum Rainfall (mm/hr)	0
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits


Network Design Table for Storm

# - Indicates pipe length does not match coordinates
















PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
1.000	23.076	0.160	144.2	0.057	6.00	0.0	0.600	o	225	
1.001	33.695	0.150	224.6	0.045	0.00	0.0	0.600	o	300	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	0.00	6.35	124.500	0.057	0.0	0.0	0.0	1.09	43.2	0.0
1.001	0.00	6.89	124.265	0.102	0.0	0.0	0.0	1.04	73.9	0.0


Woods Hardwick		Page 2
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

Network Design Table for Storm














PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
1.002	30.293	0.190	159.4	0.100	0.00	0.0	0.600	o	300	
1.003	15.572	0.100	155.7	0.078	0.00	0.0	0.600	o	300	
2.000	18.369	0.275	66.8	0.060	6.00	0.0	0.600	o	300	
1.004	24.458	0.095	257.5	0.031	0.00	0.0	0.600	o	450	
1.005	24.204	0.080	302.6	0.138	0.00	0.0	0.600	o	450	
1.006	54.633	0.175	312.2	0.129	0.00	0.0	0.600	o	450	
1.007	22.722	0.104	218.5	0.010	0.00	0.0	0.600	oo	41	
1.008	65.735	0.136	483.3	0.071	0.00	0.0	0.600	o	525	
1.009	8.406	0.020	420.3	0.000	0.00	0.0	0.600	o	525	
3.000	43.030	0.230	187.1	0.090	6.00	0.0	0.600	o	300	
3.001	4.430	0.030	147.7	0.000	0.00	0.0	0.600	o	300	
3.002	42.281	0.175	241.6	0.067	0.00	0.0	0.600	o	300	
1.010	16.811	0.038	442.4	0.000	0.00	0.0	0.600	o	525	
1.011	24.443#	0.062	394.2	0.000	0.00	0.0	0.600	3 \=/	525	
1.012	3.190	0.010	319.0	0.000	0.00	0.0	0.600	o	525	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.002	0.00	7.30	124.115	0.202	0.0	0.0	0.0	1.24	87.8	0.0
1.003	0.00	7.50	123.925	0.280	0.0	0.0	0.0	1.26	88.9	0.0
2.000	0.00	6.16	123.950	0.060	0.0	0.0	0.0	1.93	136.2	0.0
1.004	0.00	7.83	123.675	0.371	0.0	0.0	0.0	1.26	200.8	0.0
1.005	0.00	8.17	123.580	0.509	0.0	0.0	0.0	1.16	185.1	0.0
1.006	0.00	8.97	123.500	0.638	0.0	0.0	0.0	1.15	182.1	0.0
1.007	0.00	9.33	123.250	0.648	0.0	0.0	0.0	1.06	149.2	0.0
1.008	0.00	10.41	123.146	0.719	0.0	0.0	0.0	1.01	219.1	0.0
1.009	0.00	10.54	123.010	0.719	0.0	0.0	0.0	1.09	235.1	0.0
3.000	0.00	6.63	123.650	0.090	0.0	0.0	0.0	1.15	81.0	0.0
3.001	0.00	6.68	123.420	0.090	0.0	0.0	0.0	1.29	91.3	0.0
3.002	0.00	7.38	123.390	0.157	0.0	0.0	0.0	1.01	71.2	0.0
1.010	0.00	10.80	122.990	0.876	0.0	0.0	0.0	1.06	229.1	0.0
1.011	0.00	11.24	122.952	0.876	0.0	0.0	0.0	0.94	137.5	0.0
1.012	0.00	11.28	122.890	0.876	0.0	0.0	0.0	1.25	270.3	0.0


Woods Hardwick		Page 3
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34 File SW West Proposed 13.01.2...	Designed by a.tew Checked by	
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Network Design Table for Storm












PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
1.013	9.350#	0.019	492.1	0.000	0.00	0.0	0.600	o	525	
4.000	48.968#	0.170	288.0	0.096	6.00	0.0	0.600	o	375	
4.001	29.802#	0.100	298.0	0.060	0.00	0.0	0.600	o	375	
4.002	13.142#	0.054	243.4	0.022	0.00	0.0	0.600	o	375	
5.000	54.889#	0.280	196.0	0.094	6.00	0.0	0.600	o	225	
5.001	23.748#	0.054	439.8	0.080	0.00	0.0	0.600	o	450	
1.014	44.270#	0.090	491.9	0.000	0.00	0.0	0.600	3 \=/	525	
1.015	6.454	0.015	430.3	0.000	0.00	0.0	0.600	o	525	
1.016	4.436	0.009	492.9	0.000	0.00	0.0	0.600	o	525	
6.000	25.590#	0.455	56.2	0.108	6.00	0.0	0.600	o	225	
7.000	18.881#	0.080	236.0	0.065	6.00	0.0	0.600	o	300	
6.001	15.459#	0.070	220.8	0.040	0.00	0.0	0.600	o	300	
6.002	10.259#	0.050	205.2	0.000	0.00	0.0	0.600	o	300	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.013	0.00	11.43	122.880	0.876	0.0	0.0	0.0	1.00	217.1	0.0
4.000	0.00	6.77	123.100	0.096	0.0	0.0	0.0	1.06	117.3	0.0
4.001	0.00	7.24	122.930	0.156	0.0	0.0	0.0	1.04	115.3	0.0
4.002	0.00	7.43	122.830	0.178	0.0	0.0	0.0	1.16	127.8	0.0
5.000	0.00	6.98	123.060	0.094	0.0	0.0	0.0	0.93	37.0	0.0
5.001	0.00	7.39	122.780	0.174	0.0	0.0	0.0	0.96	153.2	0.0
1.014	0.00	12.31	122.726	1.228	0.0	0.0	0.0	0.84	122.9	0.0
1.015	0.00	12.41	122.635	1.228	0.0	0.0	0.0	1.07	232.4	0.0
1.016	0.00	12.49	122.620	1.228	0.0	0.0	0.0	1.00	216.9	0.0
6.000	0.00	6.24	123.100	0.108	0.0	0.0	0.0	1.75	69.5	0.0
7.000	0.00	6.31	122.650	0.065	0.0	0.0	0.0	1.02	72.0	0.0
6.001	0.00	6.55	122.570	0.213	0.0	0.0	0.0	1.05	74.5	0.0
6.002	0.00	6.71	122.500	0.213	0.0	0.0	0.0	1.09	77.3	0.0


Woods Hardwick		Page 4
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34 File SW West Proposed 13.01.2...	Designed by a.tew Checked by	
XP Solutions		Network 2014.1.1

Network Design Table for Storm














PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
6.003	18.087#	0.095	190.4	0.065	0.00	0.0	0.600	o	300	
8.000	9.323#	0.060	155.4	0.067	6.00	0.0	0.600	o	225	
9.000	16.200#	0.130	124.6	0.017	6.00	0.0	0.600	o	225	
8.001	32.282#	0.195	165.5	0.009	0.00	0.0	0.600	o	225	
8.002	26.594#	0.115	231.3	0.107	0.00	0.0	0.600	o	300	
6.004	59.029#	0.150	393.5	0.067	0.00	0.0	0.600	o	525	
6.005	15.889#	0.040	397.2	0.190	0.00	0.0	0.600	o	525	
10.000	21.879#	0.095	230.3	0.140	6.00	0.0	0.600	o	300	
1.017	60.578#	0.121	500.6	0.000	0.00	0.0	0.600	3 \=/	900	
11.000	34.108	0.200	170.5	0.102	6.00	0.0	0.600	o	225	
11.001	24.426#	0.425	57.5	0.100	0.00	0.0	0.600	o	225	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
6.003	0.00	6.97	122.450	0.278	0.0	0.0	0.0	1.14	80.3	0.0
8.000	0.00	6.15	122.800	0.067	0.0	0.0	0.0	1.05	41.6	0.0
9.000	0.00	6.23	122.870	0.017	0.0	0.0	0.0	1.17	46.5	0.0
8.001	0.00	6.76	122.740	0.093	0.0	0.0	0.0	1.01	40.3	0.0
8.002	0.00	7.19	122.470	0.200	0.0	0.0	0.0	1.03	72.8	0.0
6.004	0.00	8.07	122.130	0.545	0.0	0.0	0.0	1.12	243.1	0.0
6.005	0.00	8.31	121.980	0.735	0.0	0.0	0.0	1.12	241.9	0.0
10.000	0.00	6.35	122.820	0.140	0.0	0.0	0.0	1.03	72.9	0.0
1.017	0.00	13.63	121.940	2.103	0.0	0.0	0.0	0.89	179.5	0.0
11.000	0.00	6.57	122.700	0.102	0.0	0.0	0.0	1.00	39.7	0.0
11.001	0.00	6.80	122.500	0.202	0.0	0.0	0.0	1.73	68.7	0.0

Woods Hardwick		Page 5
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34 File SW West Proposed 13.01.2...	Designed by a.tew Checked by	
XP Solutions		Network 2014.1.1















Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
12.000	21.313#	0.206	103.5	0.094	6.00	0.0	0.600	o	225	
1.018	10.565#	0.020	528.3	0.000	0.00	0.0	0.600	o	900	
1.019	15.518#	0.048	323.3	0.000	0.00	0.0	0.600	o	750	
1.020	33.421#	0.058	576.2	0.000	0.00	0.0	0.600	o	600	
13.000	18.480#	1.059	17.5	0.090	6.00	0.0	0.600	o	150	
1.021	36.931#	0.074	499.1	0.000	0.00	0.0	0.600	3 \=/	600	
14.000	15.326#	0.062	247.2	0.051	6.00	0.0	0.600	o	300	
14.001	38.915#	0.160	243.2	0.068	0.00	0.0	0.600	o	300	
14.002	23.550#	0.097	242.8	0.030	0.00	0.0	0.600	o	300	
14.003	26.177#	0.100	261.8	0.001	0.00	0.0	0.600	o	300	
15.000	7.525	0.300	25.1	0.033	6.00	0.0	0.600	o	300	
15.001	33.256	0.270	123.2	0.048	0.00	0.0	0.600	o	300	
15.002	17.857	0.180	99.2	0.092	0.00	0.0	0.600	o	375	

Network Results Table


PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
12.000	0.00	6.28	122.300	0.094	0.0	0.0	0.0	1.29	51.1	0.0
1.018	0.00	13.76	121.720	2.399	0.0	0.0	0.0	1.36	862.8	0.0
1.019	0.00	13.92	121.700	2.399	0.0	0.0	0.0	1.55	685.2	0.0
1.020	0.00	14.47	121.650	2.399	0.0	0.0	0.0	1.01	284.8	0.0
13.000	0.00	6.13	122.750	0.090	0.0	0.0	0.0	2.42	42.8	0.0
1.021	0.00	15.20	121.591	2.489	0.0	0.0	0.0	0.85	133.4	0.0
14.000	0.00	6.26	121.670	0.051	0.0	0.0	0.0	1.00	70.4	0.0
14.001	0.00	6.90	121.608	0.119	0.0	0.0	0.0	1.00	70.9	0.0
14.002	0.00	7.29	121.448	0.149	0.0	0.0	0.0	1.00	71.0	0.0
14.003	0.00	7.74	121.351	0.150	0.0	0.0	0.0	0.97	68.4	0.0
15.000	0.00	6.04	124.300	0.033	0.0	0.0	0.0	3.15	222.8	0.0
15.001	0.00	6.43	124.000	0.081	0.0	0.0	0.0	1.42	100.1	0.0
15.002	0.00	6.59	123.655	0.173	0.0	0.0	0.0	1.82	200.9	0.0

Network Design Table for Storm















PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
16.000	25.888	0.415	62.4	0.045	6.00	0.0	0.600	o	225	
16.001	23.292	0.190	122.6	0.124	0.00	0.0	0.600	o	225	
15.003	62.260	0.580	107.3	0.135	0.00	0.0	0.600	o	525	
17.000	23.364	0.335	69.7	0.107	6.00	0.0	0.600	o	225	
17.001	51.510	0.545	94.5	0.132	0.00	0.0	0.600	o	375	
17.002	9.698	0.060	161.6	0.093	0.00	0.0	0.600	oo	-5	
17.003	70.468	0.225	313.2	0.000	0.00	0.0	0.600	o	375	
17.004	42.356	0.090	470.6	0.050	0.00	0.0	0.600	o	525	
17.005	7.247	0.020	362.4	0.000	0.00	0.0	0.600	o	525	
15.004	28.254	0.075	376.7	0.076	0.00	0.0	0.600	o	600	
15.005	45.556	0.253	180.1	0.078	0.00	0.0	0.600	o	750	
18.000	37.000	0.090	411.1	0.060	6.00	10.8	0.600	o	450	
18.001	11.062	0.027	409.7	0.010	0.00	0.0	0.600	o	450	
15.006	26.656	0.035	761.6	0.010	0.00	0.0	0.600	o	750	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
16.000	0.00	6.26	124.230	0.045	0.0	0.0	0.0	1.66	66.0	0.0
16.001	0.00	6.59	123.815	0.169	0.0	0.0	0.0	1.18	46.9	0.0
15.003	0.00	7.08	123.325	0.477	0.0	0.0	0.0	2.16	467.9	0.0
17.000	0.00	6.25	124.170	0.107	0.0	0.0	0.0	1.57	62.3	0.0
17.001	0.00	6.71	123.685	0.239	0.0	0.0	0.0	1.86	205.9	0.0
17.002	0.00	6.87	123.140	0.332	0.0	0.0	0.0	1.03	82.1	0.0
17.003	0.00	8.02	123.080	0.332	0.0	0.0	0.0	1.02	112.5	0.0
17.004	0.00	8.71	122.855	0.382	0.0	0.0	0.0	1.03	222.1	0.0
17.005	0.00	8.81	122.765	0.382	0.0	0.0	0.0	1.17	253.4	0.0
15.004	0.00	9.19	122.670	0.935	0.0	0.0	0.0	1.25	353.0	0.0
15.005	0.00	9.55	122.445	1.013	0.0	0.0	0.0	2.08	920.0	0.0
18.000	0.00	6.62	122.309	0.060	10.8	0.0	0.0	1.00	158.5	10.8
18.001	0.00	6.80	122.219	0.070	10.8	0.0	0.0	1.00	158.7	10.8
15.006	0.00	9.99	122.192	1.093	10.8	0.0	0.0	1.01	444.5	10.8

Woods Hardwick		Page 7
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34 File SW West Proposed 13.01.2...	Designed by a.tew Checked by	
XP Solutions		Network 2014.1.1













Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
15.007	39.783	0.052	765.1	0.134	0.00	0.0	0.600	o	750	
15.008	37.152	0.048	774.0	0.130	0.00	0.0	0.600	o	750	
15.009	77.855	0.100	778.6	0.246	0.00	0.0	0.600	o	750	
15.010	13.442	0.018	746.8	0.130	0.00	0.0	0.600	o	750	
15.011	38.118	0.049	777.9	0.009	0.00	0.0	0.600	o	750	
19.000	14.910	0.100	149.1	0.050	6.00	0.0	0.600	o	150	
19.001	11.780	0.040	294.5	0.055	0.00	0.0	0.600	o	375	
19.002	12.326	0.045	273.9	0.070	0.00	0.0	0.600	o	375	
15.012	63.874	0.086	742.7	0.115	0.00	0.0	0.600	o	750	
15.013	16.570#	0.023	720.4	0.057	0.00	0.0	0.600	o	750	
14.004	18.318#	0.027	678.4	0.000	0.00	0.0	0.600	3 \=/	750	
1.022	5.384	0.009	598.2	0.000	0.00	0.0	0.600	o	900	
1.023	2.428	0.005	485.6	0.000	0.00	0.0	0.600	o	900	
20.000	141.271	0.323	437.4	1.930	6.00	0.0	0.600	o	825	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
15.007	0.00	10.65	122.157	1.227	10.8	0.0	0.0	1.00	443.5	10.8
15.008	0.00	11.28	122.105	1.357	10.8	0.0	0.0	1.00	440.9	10.8
15.009	0.00	12.58	122.057	1.603	10.8	0.0	0.0	1.00	439.6	10.8
15.010	0.00	12.80	121.957	1.733	10.8	0.0	0.0	1.02	448.9	10.8
15.011	0.00	13.44	121.939	1.742	10.8	0.0	0.0	1.00	439.8	10.8
19.000	0.00	6.30	121.920	0.050	0.0	0.0	0.0	0.82	14.5	0.0
19.001	0.00	6.49	121.820	0.105	0.0	0.0	0.0	1.05	116.0	0.0
19.002	0.00	6.68	121.780	0.175	0.0	0.0	0.0	1.09	120.4	0.0
15.012	0.00	14.48	121.360	2.032	10.8	0.0	0.0	1.02	450.2	10.8
15.013	0.00	14.75	121.274	2.089	10.8	0.0	0.0	1.03	457.2	10.8
14.004	0.00	15.16	121.251	2.239	10.8	0.0	0.0	0.74	133.9	10.8
1.022	0.00	15.27	121.224	4.728	10.8	0.0	0.0	1.27	810.3	10.8
1.023	0.00	15.30	121.215	4.728	10.8	0.0	0.0	1.42	900.2	10.8
20.000	0.00	7.67	123.463	1.930	0.0	0.0	0.0	1.41	755.4	0.0


Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
20.001	22.063	0.063	350.2	0.000	0.00	0.0	0.600	∞	-3	
20.002	36.705	0.082	447.6	0.050	0.00	0.0	0.600	o	750	
21.000	35.601	0.440	80.9	0.078	6.00	0.0	0.600	o	300	
21.001	57.669	0.535	107.8	0.159	0.00	0.0	0.600	o	375	
21.002	23.646	0.280	84.5	0.137	0.00	0.0	0.600	o	450	
22.000	39.575	0.125	316.6	0.166	6.00	0.0	0.600	o	450	
21.003	25.577	0.075	341.0	0.025	0.00	0.0	0.600	o	675	
23.000	73.442	0.500	146.9	0.128	6.00	0.0	0.600	o	300	
23.001	36.499	0.235	155.3	0.116	0.00	0.0	0.600	o	375	
21.004	28.114	0.085	330.8	0.047	0.00	0.0	0.600	o	675	
21.005	12.861	0.050	257.2	0.120	0.00	0.0	0.600	o	675	
24.000	5.278	0.030	175.9	0.098	6.00	0.0	0.600	o	675	
















Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
20.001	0.00	7.92	123.140	1.930	0.0	0.0	0.0	1.43	1098.6	0.0
20.002	0.00	8.39	123.027	1.980	0.0	0.0	0.0	1.32	581.5	0.0
21.000	0.00	6.34	125.220	0.078	0.0	0.0	0.0	1.75	123.7	0.0
21.001	0.00	6.89	124.705	0.237	0.0	0.0	0.0	1.74	192.7	0.0
21.002	0.00	7.07	124.095	0.374	0.0	0.0	0.0	2.21	352.0	0.0
22.000	0.00	6.58	123.940	0.166	0.0	0.0	0.0	1.14	180.9	0.0
21.003	0.00	7.37	123.815	0.565	0.0	0.0	0.0	1.41	505.8	0.0
23.000	0.00	6.95	124.850	0.128	0.0	0.0	0.0	1.30	91.5	0.0
23.001	0.00	7.36	124.275	0.244	0.0	0.0	0.0	1.45	160.3	0.0
21.004	0.00	7.70	123.740	0.856	0.0	0.0	0.0	1.44	513.7	0.0
21.005	0.00	7.83	123.655	0.976	0.0	0.0	0.0	1.63	583.1	0.0
24.000	0.00	6.04	123.630	0.098	0.0	0.0	0.0	1.97	706.0	0.0




Woods Hardwick		Page 9
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

Network Design Table for Storm









PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
21.006	5.566	0.055	101.2	0.000	0.00	0.0	0.600	o	150	
20.003	44.771	0.100	447.7	0.000	0.00	0.0	0.600	o	750	
20.004	4.000	0.010	400.0	0.000	0.00	0.0	0.600	o	750	
20.005	27.166	0.080	339.6	0.000	0.00	0.0	0.600	o	750	
25.000	11.633	1.490	7.8	0.255	6.00	0.0	0.600	o	150	
20.006	41.906	0.425	98.6	0.000	0.00	0.0	0.600	o	750	
20.007	10.069	0.025	402.8	0.000	0.00	0.0	0.600	o	750	
20.008	89.212	0.237	376.4	0.000	0.00	0.0	0.600	o	750	
20.009	45.691	0.108	423.1	0.000	0.00	0.0	0.600	o	750	
20.010	48.256	0.242	199.4	0.000	0.00	0.0	0.600	o	750	
20.011	74.990	0.218	344.0	0.000	0.00	0.0	0.600	o	750	
1.024	75.149	0.300	250.5	0.000	0.00	0.0	0.600	o	900	
1.025	14.377	0.020	718.9	0.000	0.00	0.0	0.600	o	900	
1.026	12.562	0.020	628.1	0.000	0.00	0.0	0.600	o	900	
1.027	43.989	0.080	549.9	0.000	0.00	0.0	0.600	o	900	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
21.006	0.00	7.92	123.600	1.074	0.0	0.0	0.0	1.00	17.6	0.0
20.003	0.00	8.96	122.945	3.054	0.0	0.0	0.0	1.32	581.4	0.0
20.004	0.00	9.00	122.845	3.054	0.0	0.0	0.0	1.39	615.4	0.0
20.005	0.00	9.30	122.535	3.054	0.0	0.0	0.0	1.51	668.4	0.0
25.000	0.00	6.05	124.545	0.255	0.0	0.0	0.0	3.63	64.1	0.0
20.006	0.00	9.55	122.455	3.309	0.0	0.0	0.0	2.82	1245.2	0.0
20.007	0.00	9.67	122.030	3.309	0.0	0.0	0.0	1.39	613.3	0.0
20.008	0.00	10.71	122.005	3.309	0.0	0.0	0.0	1.44	634.6	0.0
20.009	0.00	11.27	121.768	3.309	0.0	0.0	0.0	1.35	598.3	0.0
20.010	0.00	11.68	121.660	3.309	0.0	0.0	0.0	1.98	873.9	0.0
20.011	0.00	12.51	121.418	3.309	0.0	0.0	0.0	1.50	664.1	0.0
1.024	0.00	15.93	121.050	8.037	10.8	0.0	0.0	1.98	1256.6	10.8
1.025	0.00	16.14	120.750	8.037	10.8	0.0	0.0	1.16	738.5	10.8
1.026	0.00	16.31	120.730	8.037	10.8	0.0	0.0	1.24	790.6	10.8
1.027	0.00	16.86	120.710	8.037	10.8	0.0	0.0	1.33	845.5	10.8

Woods Hardwick		Page 10
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
1.028	11.362	0.027	420.8	0.000	0.00	0.0	0.600	o	900	
1.029	49.420	0.133	371.6	1.000	0.00	0.0	0.600	o	900	
1.030	36.960	0.265	139.5	1.000	0.00	0.0	0.600	o	900	
1.031	119.800	0.640	187.2	0.500	0.00	0.0	0.600	o	900	
1.032	1.350	0.005	270.0	0.000	0.00	0.0	0.600	o	600	
1.033	184.800	2.050	90.1	0.000	0.00	0.0	0.600	\/	-4	
1.034	149.300	1.770	84.4	0.000	0.00	0.0	0.600	\/	-4	
1.035	2.700	0.030	90.0	0.000	0.00	0.0	0.600	oo	45	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.028	0.00	16.99	120.630	8.037	10.8	0.0	0.0	1.52	967.6	10.8
1.029	0.00	17.49	120.583	9.037	10.8	0.0	0.0	1.62	1030.3	10.8
1.030	0.00	17.73	120.450	10.037	10.8	0.0	0.0	2.65	1686.8	10.8
1.031	0.00	18.60	120.185	10.537	10.8	0.0	0.0	2.29	1454.9	10.8
1.032	0.00	18.61	119.545	10.537	10.8	0.0	0.0	1.48	417.7	10.8
1.033	0.00	19.15	119.140	10.537	10.8	0.0	0.0	5.80	15082.6	10.8
1.034	0.00	19.56	117.090	10.537	10.8	0.0	0.0	6.00	15593.3	10.8
1.035	0.00	19.58	115.320	10.537	10.8	0.0	0.0	2.57	1450.0	10.8

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.035	Watercourse	116.500	115.290	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m <sup>3</sup> /ha Storage	1.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0    Number of Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 5    Number of Storage Structures 9    Number of Real Time Controls 0

Synthetic Rainfall Details

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Date 17/01/2023 14:34  
File SW West Proposed 13.01.2...

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XP Solutions Network 2014.1.1

Simulation Criteria for Storm

Rainfall Model	FEH
Return Period (years)	100
Site Location	GB 450500 225250 SP 50500 25250
C (1km)	-0.023
D1 (1km)	0.328
D2 (1km)	0.309
D3 (1km)	0.264
E (1km)	0.292
F (1km)	2.461
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	15

Woods Hardwick		Page 12
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

Online Controls for Storm

Hydro-Brake® Manhole: 10 (HW), DS/PN: 1.012, Volume (m³): 439.1

Design Head (m) 1.800 Hydro-Brake® Type Md6 SW Only Invert Level (m) 122.890  
Design Flow (l/s) 7.1 Diameter (mm) 96

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.9	1.200	5.8	3.000	9.1	7.000	13.9
0.200	4.3	1.400	6.2	3.500	9.8	7.500	14.4
0.300	4.1	1.600	6.7	4.000	10.5	8.000	14.9
0.400	4.0	1.800	7.1	4.500	11.2	8.500	15.3
0.500	4.0	2.000	7.4	5.000	11.8	9.000	15.8
0.600	4.2	2.200	7.8	5.500	12.3	9.500	16.2
0.800	4.7	2.400	8.1	6.000	12.9		
1.000	5.3	2.600	8.5	6.500	13.4		

Hydro-Brake® Manhole: 14 (HB), DS/PN: 1.016, Volume (m³): 5.4

Design Head (m) 0.600 Hydro-Brake® Type Md6 SW Only Invert Level (m) 122.620  
Design Flow (l/s) 14.2 Diameter (mm) 159


Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.3	1.200	16.0	3.000	25.0	7.000	38.2
0.200	12.3	1.400	17.1	3.500	27.0	7.500	39.5
0.300	15.0	1.600	18.3	4.000	28.8	8.000	40.8
0.400	15.1	1.800	19.4	4.500	30.6	8.500	42.1
0.500	14.6	2.000	20.4	5.000	32.3	9.000	43.3
0.600	14.1	2.200	21.4	5.500	33.8	9.500	44.5
0.800	14.1	2.400	22.3	6.000	35.3		
1.000	14.9	2.600	23.3	6.500	36.8		

Pre-initialised control selected, excessive flows may result.

Hydro-Brake® Manhole: 18 (HB), DS/PN: 1.020, Volume (m³): 11.0

Design Head (m) 0.750 Hydro-Brake® Type Md6 SW Only Invert Level (m) 121.650  
Design Flow (l/s) 61.5 Diameter (mm) 279

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.1	0.500	60.8	1.200	57.0	2.000	63.8
0.200	25.9	0.600	62.0	1.400	57.5	2.200	66.4
0.300	42.9	0.800	60.6	1.600	59.1	2.400	69.1
0.400	55.5	1.000	58.1	1.800	61.2	2.600	71.8

Woods Hardwick		Page 13
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

Hydro-Brake® Manhole: 18 (HB), DS/PN: 1.020, Volume (m³): 11.0

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
3.000	77.0	5.000	99.3	7.000	117.5	9.000	133.2
3.500	83.1	5.500	104.2	7.500	121.6	9.500	136.9
4.000	88.8	6.000	108.8	8.000	125.6		
4.500	94.2	6.500	113.2	8.500	129.5		

Pre-initialised control selected, excessive flows may result.

Hydro-Brake® Manhole: 21 (HB), DS/PN: 1.023, Volume (m³): 7.8

Design Head (m) 1.100 Hydro-Brake® Type Md6 SW Only Invert Level (m) 121.215  
Design Flow (l/s) 194.0 Diameter (mm) 441

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	13.6	1.200	191.9	3.000	196.2	7.000	293.6
0.200	41.5	1.400	186.6	3.500	209.2	7.500	303.9
0.300	75.6	1.600	182.0	4.000	222.6	8.000	313.8
0.400	110.6	1.800	179.4	4.500	235.7	8.500	323.5
0.500	142.5	2.000	179.0	5.000	248.2	9.000	332.9
0.600	168.0	2.200	180.4	5.500	260.3	9.500	342.0
0.800	191.4	2.400	183.2	6.000	271.8		
1.000	194.7	2.600	186.9	6.500	282.9		


Pre-initialised control selected, excessive flows may result.

Hydro-Brake Optimum® Manhole: 279 (HB), DS/PN: 21.006, Volume (m³): 10.2

Unit Reference MD-SHE-0088-4300-1700-4300  
Design Head (m) 1.700  
Design Flow (l/s) 4.3  
Flush-Flo™ Calculated  
Objective Minimise upstream storage  
Diameter (mm) 88  
Invert Level (m) 123.600  
Minimum Outlet Pipe Diameter (mm) 150  
Suggested Manhole Diameter (mm) 1200


Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.700	4.3	Kick-Flo®	0.786	3.0
Flush-Flo™	0.387	3.7	Mean Flow over Head Range	-	3.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Woods Hardwick		Page 14
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

Hydro-Brake Optimum® Manhole: 279 (HB), DS/PN: 21.006, Volume (m<sup>3</sup>): 10.2

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.7	1.200	3.7	3.000	5.6	7.000	8.3
0.200	3.5	1.400	3.9	3.500	6.0	7.500	8.6
0.300	3.7	1.600	4.2	4.000	6.4	8.000	8.9
0.400	3.7	1.800	4.4	4.500	6.8	8.500	9.2
0.500	3.7	2.000	4.6	5.000	7.1	9.000	9.4
0.600	3.6	2.200	4.8	5.500	7.4	9.500	9.7
0.800	3.0	2.400	5.0	6.000	7.8		
1.000	3.4	2.600	5.2	6.500	8.1		

Woods Hardwick		Page 15
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

Storage Structures for Storm

Porous Car Park Manhole: 8 (B3), DS/PN: 1.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.0
Membrane Percolation (mm/hr)	1000	Length (m)	14.0
Max Percolation (l/s)	31.1	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	124.800	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: 9 (B3), DS/PN: 1.006

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	31.9
Membrane Percolation (mm/hr)	1000	Length (m)	20.0
Max Percolation (l/s)	177.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	125.080	Cap Volume Depth (m)	0.000

Complex Manhole: 9 (HW), DS/PN: 1.011

Tank or Pond

Invert Level (m) 122.952

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	65.0	2.400	430.0


Tank or Pond Manhole: 12 (HW), DS/PN: 1.014

Invert Level (m) 122.726

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	173.0	1.800	746.0

Porous Car Park Manhole: 36 (B2a), DS/PN: 6.000

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30
Membrane Percolation (mm/hr)	1000	Invert Level (m)	124.280
Max Percolation (l/s)	78.3	Width (m)	14.1
Safety Factor	2.0	Length (m)	20.0

Woods Hardwick		Page 16
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions		Network 2014.1.1

Porous Car Park Manhole: 36 (B2a), DS/PN: 6.000

Slope (1:X) 100.0 Evaporation (mm/day) 3  
 Depression Storage (mm) 5 Cap Volume Depth (m) 0.000

Porous Car Park Manhole: 43 (B2a), DS/PN: 8.001

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 6.6  
 Membrane Percolation (mm/hr) 1000 Length (m) 25.0  
 Max Percolation (l/s) 45.8 Slope (1:X) 100.0  
 Safety Factor 2.0 Depression Storage (mm) 5  
 Porosity 0.30 Evaporation (mm/day) 3  
 Invert Level (m) 123.840 Cap Volume Depth (m) 0.000

Tank or Pond Manhole: 16 (HW), DS/PN: 1.018

Invert Level (m) 121.720

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	640.0	2.150	1751.0

Tank or Pond Manhole: 20 (HW), DS/PN: 1.022

Invert Level (m) 121.224


Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	297.0	2.000	1420.0

Tank or Pond Manhole: PH10 Pond +UC, DS/PN: 24.000

Invert Level (m) 123.640

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	348.7	1.700	948.3



Woods Hardwick		Page 17
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000    Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0    MADD Factor \* 10m<sup>3</sup>/ha Storage 1.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0    Number of Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 5    Number of Storage Structures 9    Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model    FEH    D3 (1km) 0.264  
Site Location GB 450500 225250 SP 50500 25250    E (1km) 0.292  
C (1km)    -0.023    F (1km) 2.461  
D1 (1km)    0.328    Cv (Summer) 0.750  
D2 (1km)    0.309    Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)    300.0  
Analysis Timestep 2.5 Second Increment (Extended)  
DTS Status    ON  
DVD Status    ON  
Inertia Status    OFF


Profile(s)    Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440  
Return Period(s) (years)    30  
Climate Change (%)    0

PN	Storm	Return Period	Climate Change	First X Surchage	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	30	0%					
1.001	15 Winter	30	0%					
1.002	15 Winter	30	0%	30/15	Summer			
1.003	15 Winter	30	0%	30/15	Summer			
2.000	15 Winter	30	0%					
1.004	15 Winter	30	0%	30/15	Summer			
1.005	15 Winter	30	0%	30/15	Summer			
1.006	120 Winter	30	0%	30/15	Summer			
1.007	360 Winter	30	0%	30/15	Summer			
1.008	360 Winter	30	0%	30/15	Winter			
1.009	360 Winter	30	0%	30/15	Summer			
3.000	360 Winter	30	0%	30/120	Winter			
3.001	360 Winter	30	0%	30/30	Summer			
3.002	360 Winter	30	0%	30/15	Winter			
1.010	360 Winter	30	0%	30/15	Summer			

Woods Hardwick		Page 18
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	Storm	Return Climate Period	Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.011	360	Winter	30	0%				
1.012	360	Winter	30	0%	30/15	Summer		
1.013	60	Winter	30	0%				
4.000	15	Winter	30	0%				
4.001	15	Winter	30	0%				
4.002	15	Winter	30	0%				
5.000	15	Winter	30	0%				
5.001	15	Winter	30	0%				
1.014	60	Winter	30	0%				
1.015	60	Winter	30	0%				
1.016	60	Winter	30	0%				
6.000	15	Winter	30	0%				
7.000	15	Winter	30	0%	30/15	Summer		
6.001	15	Winter	30	0%	30/15	Summer		
6.002	15	Winter	30	0%	30/15	Summer		
6.003	15	Winter	30	0%	30/15	Summer		
8.000	15	Winter	30	0%				
9.000	15	Winter	30	0%				
8.001	15	Winter	30	0%				
8.002	15	Winter	30	0%	30/15	Winter		
6.004	15	Winter	30	0%				
6.005	15	Winter	30	0%	30/15	Summer		
10.000	15	Winter	30	0%				
1.017	120	Winter	30	0%				
11.000	15	Winter	30	0%	30/15	Summer		
11.001	15	Winter	30	0%	30/15	Summer		
12.000	15	Winter	30	0%				
1.018	120	Winter	30	0%				
1.019	120	Winter	30	0%				
1.020	120	Winter	30	0%				
13.000	15	Winter	30	0%				
1.021	60	Winter	30	0%				
14.000	60	Winter	30	0%	30/60	Winter		
14.001	60	Winter	30	0%	30/30	Summer		
14.002	60	Winter	30	0%	30/15	Summer		
14.003	60	Winter	30	0%	30/15	Summer		
15.000	15	Winter	30	0%				
15.001	15	Winter	30	0%				
15.002	15	Winter	30	0%				
16.000	15	Winter	30	0%				
16.001	15	Winter	30	0%	30/15	Summer		
15.003	15	Winter	30	0%				
17.000	15	Winter	30	0%				
17.001	15	Winter	30	0%				
17.002	15	Winter	30	0%	30/15	Summer		

Woods Hardwick		Page 19
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	Storm	Return Climate Period	Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
17.003	15 Winter	30	0%	30/15 Winter				
17.004	15 Winter	30	0%					
17.005	15 Winter	30	0%					
15.004	15 Winter	30	0%					
15.005	30 Winter	30	0%					
18.000	15 Winter	30	0%	30/15 Summer				
18.001	15 Winter	30	0%	30/15 Summer				
15.006	15 Winter	30	0%	30/15 Winter				
15.007	15 Winter	30	0%					
15.008	15 Winter	30	0%	30/15 Winter				
15.009	30 Winter	30	0%					
15.010	15 Winter	30	0%					
15.011	15 Winter	30	0%					
19.000	15 Winter	30	0%	30/15 Summer				
19.001	30 Winter	30	0%					
19.002	30 Winter	30	0%					
15.012	15 Winter	30	0%					
15.013	30 Winter	30	0%					
14.004	60 Winter	30	0%					
1.022	60 Winter	30	0%					
1.023	60 Winter	30	0%					
20.000	15 Winter	30	0%					
20.001	15 Winter	30	0%	30/15 Winter				
20.002	15 Winter	30	0%	30/15 Winter				
21.000	15 Winter	30	0%					
21.001	15 Winter	30	0%					
21.002	15 Winter	30	0%	30/15 Summer				
22.000	15 Summer	30	0%	30/15 Summer				
21.003	15 Winter	30	0%					
23.000	15 Winter	30	0%					
23.001	15 Winter	30	0%					
21.004	15 Winter	30	0%	30/15 Winter				
21.005	960 Winter	30	0%	30/15 Winter				
24.000	960 Winter	30	0%	30/240 Winter				
21.006	960 Winter	30	0%	30/15 Summer				
20.003	15 Winter	30	0%	30/15 Winter				
20.004	15 Summer	30	0%					
20.005	15 Winter	30	0%					
25.000	15 Winter	30	0%	30/15 Summer				
20.006	15 Winter	30	0%					
20.007	15 Winter	30	0%	30/15 Winter				
20.008	15 Winter	30	0%					
20.009	15 Winter	30	0%					
20.010	15 Winter	30	0%					
20.011	15 Winter	30	0%					

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	Storm	Return Climate Period	Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.024	15	Winter	30	0%				
1.025	15	Winter	30	0%				
1.026	15	Winter	30	0%				
1.027	15	Winter	30	0%				
1.028	15	Winter	30	0%				
1.029	60	Winter	30	0%				
1.030	15	Winter	30	0%				
1.031	15	Winter	30	0%				
1.032	15	Winter	30	0%	30/15	Summer		
1.033	15	Winter	30	0%				
1.034	15	Winter	30	0%				
1.035	15	Winter	30	0%	30/15	Winter		


PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	2 (B3)	124.617	-0.108	0.000	0.53	0.0	21.0	OK
1.001	3 (B3)	124.565	0.000	0.000	0.52	0.0	35.2	OK
1.002	4 (B3)	124.496	0.081	0.000	0.83	0.0	65.9	SURCHARGED
1.003	5 (B3)	124.374	0.149	0.000	1.22	0.0	91.6	SURCHARGED
2.000	6 (B3)	124.250	0.000	0.000	0.17	0.0	20.5	OK
1.004	7 (B3)	124.226	0.101	0.000	0.71	0.0	119.8	SURCHARGED
1.005	8 (B3)	124.125	0.095	0.000	1.04	0.0	161.2	SURCHARGED
1.006	9 (B3)	124.056	0.106	0.000	0.40	0.0	65.9	SURCHARGED
1.007	10 (B3)	124.041	0.491	0.000	0.23	0.0	30.9	SURCHARGED
1.008	7 (B2b)	124.039	0.368	0.000	0.17	0.0	33.8	SURCHARGED
1.009	8a (B2b)	124.037	0.502	0.000	0.27	0.0	33.4	SURCHARGED
3.000	29 (B2a)	124.039	0.089	0.000	0.06	0.0	4.3	SURCHARGED
3.001	30 (B2a)	124.038	0.318	0.000	0.07	0.0	4.0	SURCHARGED
3.002	30a (B2a)	124.038	0.348	0.000	0.11	0.0	7.0	SURCHARGED
1.010	8	124.036	0.521	0.000	0.25	0.0	38.2	SURCHARGED
1.011	9 (HW)	124.035	-1.347	0.000	0.00	0.0	17.7	OK
1.012	10 (HW)	124.035	0.620	0.000	0.03	0.0	5.5	SURCHARGED
1.013	11 (HB)	122.991	-0.414	0.000	0.04	0.0	5.1	OK
4.000	31 (B2a)	123.247	-0.228	0.000	0.32	0.0	34.5	OK
4.001	32 (B2a)	123.131	-0.174	0.000	0.55	0.0	55.8	OK
4.002	33 (B2a)	123.049	-0.156	0.000	0.63	0.0	63.0	OK
5.000	34 (B2b)	123.267	-0.018	0.000	0.94	0.0	33.6	OK
5.001	35 (B2b)	123.006	-0.224	0.000	0.49	0.0	62.6	OK
1.014	12 (HW)	122.985	-1.534	0.000	0.00	0.0	23.9	OK
1.015	13 (HW)	122.984	-0.176	0.000	0.11	0.0	15.9	OK
1.016	14 (HB)	122.981	-0.164	0.000	0.09	0.0	15.1	OK
6.000	36 (B2a)	123.229	-0.096	0.000	0.62	0.0	39.9	OK
7.000	42 (B2a)	123.054	0.104	0.000	0.35	0.0	21.9	SURCHARGED

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water	Flooded		Pipe		Status	
		Level (m)	Surch'd Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	O'flow (l/s)		Flow (l/s)
6.001	37 (B2a)	123.013	0.143	0.000	1.17	0.0	73.3	SURCHARGED
6.002	38 (B2a)	122.914	0.114	0.000	1.22	0.0	74.2	SURCHARGED
6.003	39 (B2a)	122.827	0.077	0.000	1.36	0.0	93.7	SURCHARGED
8.000	45 (B2a)	122.956	-0.069	0.000	0.70	0.0	24.1	OK
9.000	46 (B2a)	122.944	-0.151	0.000	0.15	0.0	6.1	OK
8.001	43 (B2a)	122.925	-0.040	0.000	0.88	0.0	33.4	OK
8.002	44 (B2a)	122.782	0.012	0.000	1.07	0.0	70.0	SURCHARGED
6.004	40 (B2a)	122.617	-0.038	0.000	0.80	0.0	176.8	OK
6.005	41 (B2a)	122.508	0.003	0.000	1.43	0.0	229.4	SURCHARGED
10.000	Private (B2b)	123.025	-0.095	0.000	0.81	0.0	51.7	OK
1.017	15 (HW)	122.149	-2.151	0.000	0.00	0.0	109.0	OK
11.000	47 (B2b)	123.010	0.085	0.000	0.97	0.0	36.4	SURCHARGED
11.001	48 (B2b)	122.819	0.094	0.000	1.10	0.0	69.9	SURCHARGED
12.000	49 (B2a)	122.445	-0.080	0.000	0.75	0.0	34.7	OK
1.018	16 (HW)	122.147	-0.473	0.000	0.13	0.0	46.9	OK
1.019	17 (HW)	122.144	-0.306	0.000	0.11	0.0	47.2	OK
1.020	18 (HB)	122.128	-0.122	0.000	0.20	0.0	47.6	OK
13.000	Private (B2b)	122.855	-0.045	0.000	0.83	0.0	33.3	OK
1.021	19 (HW)	121.995	-1.269	0.000	0.00	0.0	45.4	OK
14.000	59 (B2b)	122.010	0.040	0.000	0.15	0.0	9.1	SURCHARGED
14.001	60 (B2b)	122.009	0.101	0.000	0.32	0.0	21.2	SURCHARGED
14.002	61 (B2b)	122.005	0.257	0.000	0.38	0.0	23.9	SURCHARGED
14.003	62 (B2b)	122.001	0.350	0.000	0.34	0.0	21.2	SURCHARGED
15.000	Existing	124.360	-0.240	0.000	0.09	0.0	12.2	OK
15.001	11 (B3)	124.124	-0.176	0.000	0.35	0.0	31.9	OK
15.002	12 (B3)	123.827	-0.203	0.000	0.43	0.0	70.9	OK
16.000	13 (B3)	124.330	-0.125	0.000	0.28	0.0	17.0	OK
16.001	14 (B3)	124.294	0.254	0.000	1.52	0.0	65.6	SURCHARGED
15.003	15 (B3)	123.574	-0.276	0.000	0.44	0.0	187.5	OK
17.000	16 (B3)	124.308	-0.087	0.000	0.69	0.0	39.6	OK
17.001	17 (B3)	123.873	-0.187	0.000	0.48	0.0	92.6	OK
17.002	18 (B3)	123.629	0.264	0.000	1.66	0.0	113.1	SURCHARGED
17.003	18a (B3)	123.469	0.014	0.000	1.00	0.0	106.8	SURCHARGED
17.004	19 (B3)	123.233	-0.147	0.000	0.61	0.0	118.1	OK
17.005	19a (B3)	123.177	-0.113	0.000	0.89	0.0	123.6	OK
15.004	20 (B3)	123.161	-0.109	0.000	0.99	0.0	283.2	OK
15.005	68 (B2b)	123.041	-0.154	0.000	0.30	0.0	232.6	OK
18.000	69 (B2b)	122.960	0.201	0.000	0.21	0.0	29.2	SURCHARGED
18.001	70 (B2b)	122.949	0.280	0.000	0.30	0.0	29.0	SURCHARGED
15.006	71 (B2b)	122.942	0.000	0.000	1.05	0.0	294.5	SURCHARGED
15.007	72 (B2b)	122.907	0.000	0.000	0.82	0.0	297.1	OK
15.008	73 (B2b)	122.855	0.000	0.000	0.84	0.0	292.6	SURCHARGED
15.009	74 (B2b)	122.807	0.000	0.000	0.69	0.0	271.6	OK
15.010	75 (B2b)	122.707	0.000	0.000	1.45	0.0	289.9	OK

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water	Flooded		Pipe		Status	
		Level (m)	Surch'd Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap.	O'flow (l/s)		Flow (l/s)
15.011	76 (B2b)	122.463	-0.226	0.000	0.81	0.0	285.2	OK
19.000	77 (B2b)	122.222	0.152	0.000	1.38	0.0	18.4	SURCHARGED
19.001	78 (B2b)	122.168	-0.027	0.000	0.33	0.0	29.0	OK
19.002	79 (B2b)	122.152	-0.003	0.000	0.53	0.0	48.9	OK
15.012	80 (B2b)	122.110	0.000	0.000	0.71	0.0	280.0	OK
15.013	81 (B2b)	122.024	0.000	0.000	1.42	0.0	295.8	OK
14.004	HW 82 (B2b)	121.997	-1.213	0.000	0.03	0.0	281.7	OK
1.022	20 (HW)	121.994	-0.130	0.000	0.30	0.0	153.0	OK
1.023	21 (HB)	122.006	-0.109	0.000	0.29	0.0	153.8	OK
20.000	EX MH	124.188	-0.100	0.000	0.92	0.0	646.2	OK
20.001	EX MH	123.850	0.010	0.000	0.65	0.0	529.4	SURCHARGED
20.002	SD1	123.815	0.038	0.000	1.11	0.0	519.6	SURCHARGED
21.000	270	125.322	-0.198	0.000	0.25	0.0	28.8	OK
21.001	271	124.901	-0.179	0.000	0.51	0.0	92.6	OK
21.002	272	124.670	0.125	0.000	0.45	0.0	131.8	SURCHARGED
22.000	273	124.588	0.198	0.000	0.32	0.0	50.7	SURCHARGED
21.003	274	124.490	0.000	0.000	0.47	0.0	183.1	OK
23.000	275	125.007	-0.143	0.000	0.52	0.0	45.4	OK
23.001	276	124.502	-0.148	0.000	0.61	0.0	87.8	OK
21.004	277	124.417	0.002	0.000	0.68	0.0	273.8	SURCHARGED
21.005	278	124.396	0.066	0.000	0.05	0.0	19.8	SURCHARGED
24.000	PH10 Pond +UC	124.390	0.085	0.000	0.02	0.0	6.3	SURCHARGED
21.006	279 (HB)	124.397	0.647	0.000	0.26	0.0	3.7	SURCHARGED
20.003	280	123.711	0.016	0.000	1.05	0.0	507.3	SURCHARGED
20.004	SD2	123.595	0.000	0.000	1.15	0.0	405.9	OK
20.005	PI	123.210	-0.075	0.000	0.99	0.0	503.1	OK
25.000	0622	125.349	0.654	0.000	1.20	0.0	69.6	FLOOD RISK
20.006	SD3	122.913	-0.292	0.000	0.55	0.0	558.9	OK
20.007	SD4	122.782	0.002	0.000	1.85	0.0	564.0	SURCHARGED
20.008	SD5	122.598	-0.157	0.000	0.92	0.0	528.4	OK
20.009	SD6	122.391	-0.127	0.000	0.99	0.0	494.2	OK
20.010	SD7	122.111	-0.299	0.000	0.67	0.0	489.9	OK
20.011	SD8	121.940	-0.228	0.000	0.80	0.0	474.0	OK
1.024	SD9	121.681	-0.269	0.000	0.42	0.0	454.4	OK
1.025	SD10	121.591	-0.059	0.000	1.45	0.0	416.7	OK
1.026	SD11	121.444	-0.186	0.000	1.32	0.0	416.7	OK
1.027	SD12	121.343	-0.267	0.000	0.62	0.0	415.1	OK
1.028	SD13	121.264	-0.266	0.000	0.91	0.0	414.8	OK
1.029	0307	121.047	-0.436	0.000	0.52	0.0	438.9	OK
1.030	0306	120.920	-0.430	0.000	0.53	0.0	616.6	OK
1.031	0305	120.756	-0.329	0.000	0.57	0.0	748.1	OK
1.032	0369	120.595	0.450	0.000	2.92	0.0	693.9	SURCHARGED
1.033	Channel	119.267	-0.873	0.000	0.05	0.0	689.2	OK
1.034	Channel	117.214	-0.876	0.000	0.06	0.0	687.2	OK

Woods Hardwick		Page 23
15-17 Goldington Road Bedford Bedfordshire MK40 3NH		
Date 17/01/2023 14:34	Designed by a.tew	
File SW West Proposed 13.01.2...	Checked by	
XP Solutions	Network 2014.1.1	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m <sup>3</sup> )	Flow / Cap.	O'flow (1/s)	Pipe Flow (1/s)	Status
1.035	Double pipe	115.924	0.004	0.000	1.22	0.0	686.2	SURCHARGED